



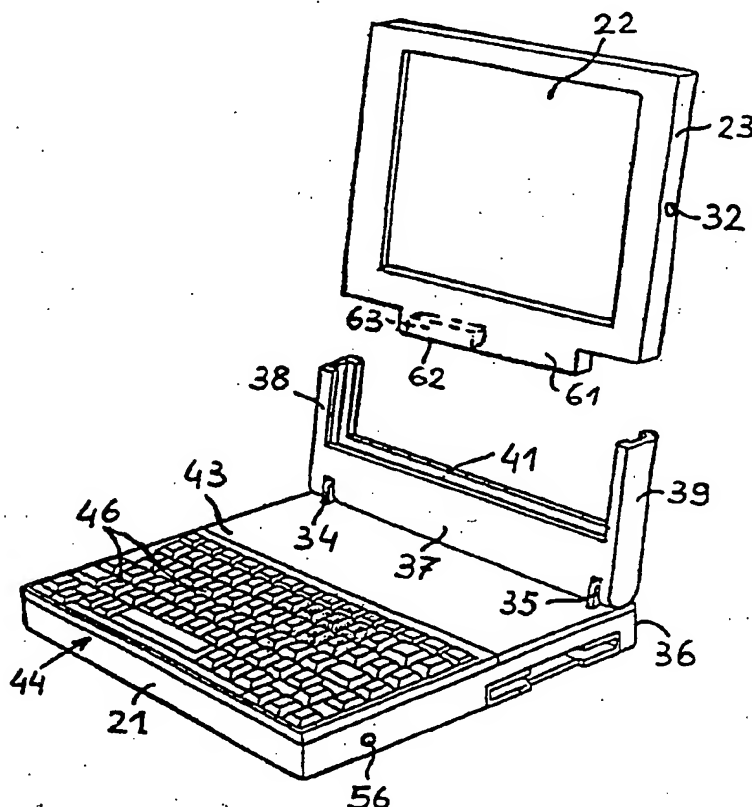
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification 6 : <b>G06F 1/16</b></p>	<p><b>A1</b></p>	<p>(11) International Publication Number: <b>WO 95/23367</b></p> <p>(43) International Publication Date: 31 August 1995 (31.08.95)</p>
<p>(21) International Application Number: PCT/IT95/00027</p> <p>(22) International Filing Date: 21 February 1995 (21.02.95)</p> <p>(30) Priority Data: TO94A000129 28 February 1994 (28.02.94) IT</p> <p>(71) Applicant (for all designated States except US): ING. C. OLIVETTI &amp; C., S.P.A. [IT/IT]; Via G. Jervis, 77, I-10015 Ivrea (IT).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): CEGLIAN, Giovanni [IT/IT]; Via Sottomondone, 14, I-10010 Salerano Canavese (IT). VARESEO, Roberto [IT/IT]; Via dei Sospiri, 23/2, I-10081 Castellamonte (IT).</p> <p>(74) Agent: CASUCCIO, Carlo; Olivetti S.p.A., Direzione Brevetti e Licensing, Via G. Jervis, 77, I-10015 Ivrea (IT).</p>		<p>(81) Designated States: AM, AU, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, JP, KG, KP, KR, KZ, LT, LV, MX, NO, NZ, PL, RO, RU, SI, SK, TJ, UA, US, UZ, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> With international search report.</p>

(54) Title: PORTABLE ELECTRONIC COMPUTER

## (57) Abstract

A portable electronic computer comprises a base body (21), a keyboard (44) mounted on the base body (21), a first electronic circuit mounted in the interior of the base body (21) and a display screen (22) also capable of performing digitizing pad functions. The display screen (22) is mounted on a support (23) which can in turn be mounted in an easily removable manner on a frame (37) which is pivoted to the base body (21). Disposed in the interior of the support (23) is a second electronic circuit capable of automatically maintaining the display screen (22) operative even when the support (23) is detached from the base body (21). Electrical connectors are provided in the lower part (61) of the support (23) and in the interior of the seat (41) of the frame (37) for mutual coupling when the support (23) is fitted into the frame (37) so that the electronic circuit disposed in the interior of the support (23) is connected to the electronic circuit disposed in the interior of the base body (21).



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PORTABLE ELECTRONIC COMPUTERFIELD OF THE INVENTION

The present invention relates to a portable electronic computer comprising a base body and a display screen with digitizing pad functions.

BACKGROUND OF THE INVENTION

European patent application No A 0419177 discloses a portable electronic computer in which the display screen with digitizing pad functions is pivoted to the base body and is movable between a first position in which the screen is closed, in superposed relationship with the base body, and a second position in which the screen is open, being adjacent to the base body and accessible on the part of the user. In that computer the display screen is integral with the base body and is not removable, except when dismantling it and rendering it unusable.

International patent application No. WO 91/00625 also discloses a portable electronic computer in which the display screen is mounted directly on the base body. In this computer also the display screen is integral with the base body and is not removable therefrom.

SUMMARY OF THE INVENTION

A preferred embodiment the present invention provides a portable electronic computer in which it is possible easily to remove the display screen with digitizing pad functions in order to be able to use it autonomously with respect to the remainder of the computer.

A portable electronic computer embodying the present invention, has a base body provided with mounting means on which the display screen is capable of being removably mounted. A circuit is provided for making autonomously operative the display screen and the associated digitizing pad functions even when the display screen is detached from the base body.

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That configuration affords the advantage of providing a computer complete with all the functions, including therein that of a digitizing pad, when the display screen is fitted into the base body or, at the choice of the user and without the use of any tool, a simple display screen with the particular digitizing pad functions, which is also autonomous in terms of circuitry with respect to the remainder of the computer when the screen is detached from the remainder of the computer.

The invention is defined in the appended claims to which reference should now be made.

An embodiment of the present invention will now be described in detail, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a front right perspective view of the portable electronic computer embodying the invention with the display screen mounted on the base body, in a first operating position,

Figure 2 is a front right perspective view of the portable electronic computer embodying to the invention with the display screen detached from the base body,

Figure 3 is a front right perspective view of the portable electronic computer embodying the invention with the display screen mounted on the base body, in a second operating position,

Figure 4 is a front view in partial section of a detail of the portable electronic computer embodying the invention, and

Figure 5 is a block diagram of the circuit means of the portable electronic computer embodying the invention.

#### DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to Figure 1 the portable electronic computer embodying the present invention which is indicated generally by reference numeral 20 comprises a base body 21 of substantially parallelepipedic shape and a display screen 22 which, besides the normal display functions, is also capable of performing digitizing pad functions by means of an electronic pen 70 of known type, for example of the electromagnetic wave type, which is

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provided with an integral battery. The digitising pad functions may also be implemented by means of a touch sensitive screen.

5 The screen 22 is fixed on a support 23 which is also of substantially parallelepipedic shape and which is so shaped as to define on a front surface thereof a frame 24 for the screen 22.

10 Disposed in the interior of the support 23 is a first electronic circuit 25 (see Figure 5) comprising a central processing unit (CPU) 26, a read only memory (ROM) 27, a random access memory (RAM) 28 and a circuit 29 for controlling and managing the functions of the screen 22. Also accommodated in the interior of the support 23 is a battery 31 of rechargeable type, which is connected to the electronic circuit 25 for supplying it with power. The support 23 is also provided with an external power supply connection 32 (Figures 1, 2 and 5) for recharging the battery 31 and for direct power supply to the electronic circuit 25.

20 A frame 37 is pivoted on two vertical lugs 34 and 35 (see Figures 1 and 2) which are disposed in the vicinity of the rear edge 36 of the base body 21. The frame 37 is shaped in such a way as to have two lateral guides 38 and 39 defining a seat 41, within which the support 23 and the associated screen 22 can be fitted in such a way as to be easily removable.

An alpha-numeric keyboard 44 provided with keys 46 is mounted on an upper surface 43 of the base body 21.

30 Also mounted within the base body 21 are a hard disk unit (HDU) 47 (see Figure 5), a floppy disk unit (FDU) 48 and a second electronic circuit 51 comprising a circuit 52 for control of the keyboard 44, a circuit 53 for control of the hard disk unit 47 and a circuit 54 for control of the floppy disk unit 48.

35 Also accommodated within the base body 21 is a second battery 55 of rechargeable type, which is connected to the electronic circuit 51 for supplying it with power.

The base body 21 is also provided with an external power supply connection 56 for recharging the battery 54 and for direct power supply to the electronic circuit 51.

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The support 23 (see Figures 2 and 4) is shaped in such a way as to have a lower part 61 on a lateral zone 62 of which is mounted a first electrical connector 63 (see Figures 4 and 5) connected to the electronic circuit 25.

5 Arranged on the bottom 69 of the seat 41, in two lateral regions 64 and 65 which are equidistant from a central axis 66 of the frame 37, are a second connector 67 and a third connector 68 respectively, which are both connected to the electronic circuit 51 in such a way as to  
10 be in mirror-image relationship relative to each other, with respect to the central axis 66.

The frame 37 which is pivoted to the vertical lugs 34 and 35 is movable between a rest position (Figure 3) in which it is adjacent to the upper surface 43 of the base  
15 body 21 in which the keyboard 44 is covered by the screen 22 and the associated support 23, and an operating position (see Figure 1) in which it is inclined at at least 90° with respect to the surface 43 of the base body  
20 21. In that operating position, with the support 23 fitted into the seat 41 of the frame 37 and the electronic circuit 25 (see Figure 5) connected to the electronic circuit 51, the computer 20 can perform all its functions, including that of a digitizing pad, by means of the  
25 electronic pen 70..

In accordance with an embodiment of the present invention the screen 22 with its support 23 can be easily detached from the base body 21 and operate autonomously as a digitizing pad, by virtue of the electronic circuit 25 which is supplied with power from the battery 31.

30 In order to withdraw the support 23 from the frame 37 in fact it is only necessary to pull the support 23 upwardly (Figure 2) and disconnect the connector 63 from the corresponding connector 67.

At the choice of the user the screen 22 with  
35 digitizing pad functions and the electronic circuit 25 associated with the screen can be supplied with power from an external power supply source by means of the connection 32.

In accordance with another feature the screen 22 with  
40 its support 23, besides operating autonomously, can be

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mounted on the frame 37 of the base body 21 in two different positions. In a first position (Figure 1) the screen 22 is turned towards the keyboard 44 and is thus facing the user who operates the keys 46 of the keyboard 44; in a second position (Figure 3) on the other hand the screen 22 is turned in the opposite direction, towards the outside of the computer. In this latter position, with the frame 37 in the rest position, the user, while not being able to use the keyboard 44 because it is covered by the support 23, can use the digitizing pad functions of the screen 22 by means of the electronic pen 70 and the memory capacities of the hard disk unit 47 and the floppy disk unit 48.

In that second position the electrical connector 63 of the support 23, rather than being connected to the connector 67, is connected to the connector 68 which performs the same function as the connector 67, being in mirror-image relationship therewith.

It will be apparent that the portable electronic computer described hereinbefore may be the subject of modifications and additions of parts without thereby departing from the scope of the present invention. For example a second central processing unit (CPU) could be fitted to the electronic circuit 51 within the base body 21 for autonomously managing the functions of the computer when the support 23 and the electronic circuit 25 mounted therein are detached from the base body 21 of the computer 20.

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CLAIMS

1. A portable electronic computer comprising a base body (21) and a display screen (20) with digitizing pad functions, characterized in that said base body is provided with mounting means (23) on which said display screen is capable of being removably mounted and that circuit means (25) are provided for making said display screen and the associated digitizing pad functions autonomously operative even when said display screen is detached from said base body.
2. A portable electronic computer according to claim 1 characterized in that said display screen is mounted on a support (23), said circuit means comprise a first electronic circuit (25) accommodated in the interior of said support and a second electronic circuit (50) accommodated in the interior of said base body, electrical connection means (63,67) being provided for electrically connecting said first electronic circuit and said second electronic circuit.
3. A portable electronic computer according to claim 2 characterized in that said first electronic circuit comprises a central processing unit (CPU), read only memory means (ROM) and random access memory means (RAM).
4. A portable electronic computer according to claim 2 characterized in that a first battery (31) is mounted in said support for electrically powering said first electronic circuit.
5. A portable electronic computer according to claim 4 characterized in that said first battery is of rechargeable type, said support being provided with a first power supply connection (32) connectable to external power supply means for recharging of said first battery and/or the power supply to said first electronic circuit.



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6. A portable electronic computer according to claim 4 characterized in that a second battery (54) is mounted in said base body for electrically powering said second electronic circuit.
  7. A portable electronic computer according to claim 6 characterized in that said second battery is of rechargeable type, said base body being provided with a second power supply connection (56) connectable to external power supply means for recharging of said second battery and/or the power supply to said second electronic circuit.
  8. A portable electronic computer according to claim 2 characterized in that a keyboard (44) is mounted on the upper part of said base body and is operatively connected to said second electronic circuit.
  9. A portable electronic computer according to claim 2 characterized in that at least one disk memory unit (FDU) is mounted in the interior of said base body and is operatively connected to said second electronic circuit.
  10. A portable electronic computer according to claim 1 characterized in that said mounting means comprise a frame (37) which is pivoted on said base body and comprises a seat (41) capable of removably accommodating said display screen.
  11. A portable electronic computer according to claim 8 and claim 10 characterized in that said frame (37) is movable between a rest position adjacent to the upper part of said base body and an operating position in which it is inclined with respect to the upper part of said base body, the support (23) of said display screen acting as a cover for said keyboard when it is accommodated in said frame and said frame is in said rest position.
  12. A portable electronic computer according to claim 11 characterized in that said support (23) is of
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substantially parallelepipedic shape and has a front surface substantially formed by said display screen (22), said frame being shaped in such a way as to permit mounting of said support in two different positions, in a first of which said front surface and said display screen are turned towards the upper part of the base body and the keyboard and in a second of which said front surface and said display screen are turned in the opposite direction towards the outside of the computer.

13. A portable electronic computer according to claims 2 and 10 characterized in that said support (23) comprises a lower part (61) capable of being accommodated in a corresponding lower part of said seat (41) and that said first electrical connection means comprise a first electrical connector (63) mounted in said lower part of the support and connected to said first electronic circuit, and a second electrical connector (67) mounted in the interior of said seat (41) and connected to said second electronic circuit.

14. A portable electronic computer according to claims 12 and 13 characterized in that said first electrical connector (63) is disposed in a lateral region of the lower part of the support (23) and that said second electrical connector (67) is disposed in a first lateral region of said seat for connection to said first electrical connector when said support is fitted on the base body in said first position.

15. A portable electronic computer according to claim 14 characterized in that said electrical connection means further comprise a third electrical connector (68) mounted in a second lateral region of said seat (41) adjacent to said first lateral region and on the opposite side with respect to a central axis of said seat, said third electrical connector (63) also being connected to said second electronic circuit and being capable of coupling to said first electrical connector when said support is fitted on the base body in said second position.

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16. A portable electronic computer comprising a base body (21), a keyboard (44) mounted on said base body, first circuit means connected to said keyboard, a cover element for said keyboard and a display screen (22), characterized in that said display screen is also capable of performing digitizing pad functions and is mounted on a support (23) in the interior of which are accommodated second circuit means capable of maintaining said display screen autonomously operative, said support being capable of being removably fitted into a seat (41) of said cover element, electrical connection means (63,67,68) being provided in said support and in said cover element for coupling to each other and for connecting said first circuit means to said second circuit means when said support is fitted in said cover element.

17. A portable electronic computer according to claim 16 characterized in that said second circuit means comprise a central processing unit (CPU), read only memory means (ROM), random access memory means (RAM), a first battery being mounted in the interior of said support for electrically powering said second circuit means.

18. A portable electronic computer according to claim 17 characterized in that a magnetic disk memory (HDD) is mounted in said base body and is connected to said first circuit means, a second battery being mounted in the interior of said base body for electrically powering said first circuit means.

19. A portable electronic computer according to claim 18 characterized in that said support is capable of being mounted in said cover element in two different positions, in a first of which said display screen is turned towards the keyboard and in a second of which said display screen is turned in the opposite direction, towards the outside of the computer, said electrical connection means being coupled to each other in both the positions of said support.

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20. A portable electronic computer comprising a base body (21), a keyboard (44) mounted on said base body, a cover for said keyboard including a display screen (22), said cover being pivotally mounted on said base body and being movable between an open position in which the keyboard may be used and a closed position in which the keyboard is covered by the cover and display screen characterised in that in a first configuration of said base body and said cover, said display screen faces said keyboard in said closed position and in a second configuration said display screen is on the outside of said computer in said closed position.

## INTERNATIONAL SEARCH REPORT

Int. Appl. No.

PCT/IT 95/00027

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G06F1/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,5 264 992 (HOGDAHL PER ET AL) 23 November 1993 see column 2, line 15 - line 46; claim 1 see column 4, line 15 - column 6, line 58 see column 7, line 40 - line 61 see column 10, line 45 - column 11, line 19	1-4,8,9, 16,17
Y	---	5,10-15
X	GB,A,2 258 325 (MA HSI KUANG ; SHIH YING KUANG (TW); MA HSI KUANG (TW)) 3 February 1993 see page 2, line 4 - line 24 see page 3, line 18 - page 4, line 19	1-4,6,8, 9,16-18
Y A	---	19 7
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

24 May 1995

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02.06.95

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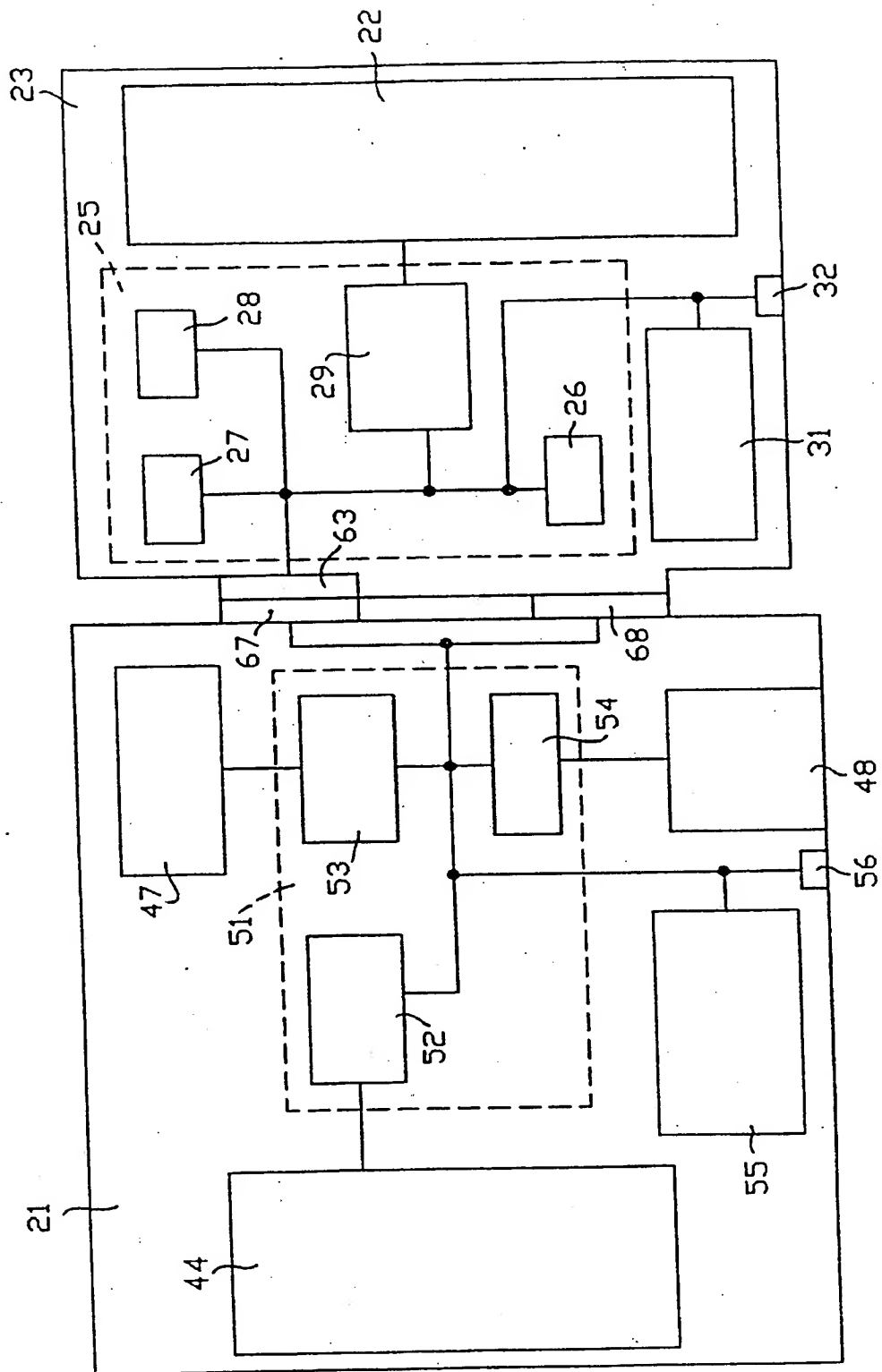


Fig. 5

